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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,545	10/29/2003	Xunming Deng	03026/PHYS00402	7826

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EXAMINER	
BARTON, JEFFREY THOMAS	

ART UNIT	PAPER NUMBER
1795	

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09/05/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/696,545	DENG, XUNMING	
	Examiner	Art Unit	
	Jeffrey T. Barton	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,11,12,14 and 75-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11,12,14 and 75-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 14 May 2008 does not place the Application in condition for allowance.

Status of Objections and Rejections Pending Since the Office Action of 14 November 2007

2. All objections and rejections of claims 2-10, 13, 15, 16, and 70-74 are obviated by cancellation of the claims.

3. The objection to claim 1 is withdrawn due to Applicant's amendment.

4. All rejections are withdrawn due to Applicant's amendment.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 11, 12, 14, and 75-78 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification as originally filed for "the first and second p-type sub-window layers

having substantially the same chemical composition but having different bandgaps", as recited in lines 13-14 of claim 1, nor is there support for "the second sub-window layer [having] a bandgap wider than the bandgap of the first sub-window layer" recited in lines 14-15 of claim 1, or for a cell "wherein there is a minimal mismatch between the bandgap of the first sub-window layer and the bandgap of the absorber layer that is adjacent to the first sub-window layer", as recited in lines 15-17 of claim 1. The specification teaches no cell specifically having these attributes.

Since claims 11, 12, 14, and 75-78 depend from claim 1, the same grounds apply to these claims.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1, 11, 12, 14, and 75-78 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear how close to the same composition the first and second p-type sub-window layers must have in order to be considered to have "substantially" the same composition as recited in claim 1. The specification has no teaching that makes the intended scope of this limitation clear. Likewise, it is not clear what degree of mismatch would be considered to be a "minimal" mismatch between the first sub-window layer and the absorber layer as also recited in claim 1. It is impossible to determine the scope of the claim.

Since claims 11, 12, 14, and 75-78 depend from claim 1, the same grounds apply to these claims.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 11, 12, 75, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Ma et al.

Ma et al teach a solar cell comprising an absorber layer (Intrinsic Si layer) and a doped window layer comprising two sub-layers (Figure 6; microcrystalline and amorphous p-type SiC layers), wherein the first sub-window layer (p-type a-SiC) is adjacent the absorber layer and forms a desirable junction with the absorber layer, wherein the second sub-window layer (microcrystalline p-type SiC) is adjacent the first sub-window layer and has high optical transmission (Layers on the order of a few nm thick will have "high" optical transmission; Figure 4), wherein the absorber layer is amorphous silicon (Page 418, 2nd column, 1st full paragraph), and wherein the two sub-window layers are taught as having substantially the same chemical composition (i.e. p-type SiC) but having different bandgaps (Figure 6), with the microcrystalline sub-window layer having a wider bandgap that the amorphous sub-window layer. The mismatch between the first sub-window layer and the absorber can be described as

"minimal" (Figure 6) Ma et al disclose a glass substrate (Page 417, paragraph bridging 1st and 2nd columns) and a TCO adjacent the second sub-window layer. (Figure 6)

Claims 75 and 76 are drawn to formation of a product by a specified process, and do not add any structure that can distinguish these product claims. The claims are rejected on the same grounds as applied to claim 1. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al in view of Sano et al.

Ma et al teach a solar cell as described above in addressing claims 1, 11, 12, 75, and 76.

Ma et al do not explicitly disclose a buffer layer between the absorber and first sub window layer.

Sano et al teach that enhanced open circuit voltage results from inclusion of an interfacial semiconductor layer (18) between the p-type window and i-type absorber layers in amorphous silicon solar cells. (Paragraphs 0044-0047)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the solar cell of Ma et al by adding an interfacial layer between the window and absorber layers, as taught by Sano et al, because Sano et al teaches that such a layer provides enhance open circuit voltage. (Paragraph 0045)

Response to Arguments

14. Applicant's arguments filed 14 May 2008 have been fully considered but they are not persuasive. The Examiner agrees that the prior art cited in the previous rejections does not meet the new limitations recited in claim 1. However, the original specification is not considered to support the new limitations, and the new limitations are also indefinite, as described in detail in the rejections under 35 U.S.C. §112. Furthermore,

insofar as scope of the claims can be determined, the Ma et al reference is considered to anticipate several claims, as noted above.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571)272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

JTB
2 September 2008